BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Diploma in Environmental Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Environmental Science
Unit number and title	**Unit 5: Principles and Applications of Biology II**
Learning aim(s)	**A:** Understand biological molecules and pathways and their effect on the body
Assignment title	**Biological molecules and human health**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are a trainee technician and have been working in a biochemistry lab for six months. Your supervisor has asked you to prepare a report and/or leaflet that explains, discusses and evaluates the importance of biological molecules and how the disruption of biological molecules leads to diseases or disorders. Photographs and/or pictures of relevant biological molecules should be included.

Task	Your report/leaflet must explain the importance of biological molecules in maintaining **physiological** and **psychological** health. It must also discuss how disruption to biological molecules can lead to **one physiological** and **one psychological** disease. The impact of each disease must be evaluated. ● **Explain** the links between the structure, function and roles of the following biological molecules in living organisms: o Carbohydrates, including simple diagrams to show the carbon:hydrogen:oxygen ratio compared to other molecules and how simple sugars combine o Proteins, including the four levels of structure (primary, secondary, tertiary and quaternary) and side group structure and function o phospholipids o Nucleic acids (DNA and RNA), including diagrams to compare the structures and functions of these in the human body o Lipids, including saturated fats, unsaturated fats, as well as the formation of diglycerides and triglycerides o collagen Photographs of models and/or relevant referenced diagrams of the biological molecules would add interest and support an **explanation** of the normal functions of:

	○ **Proteins** e.g. enzymes, neurotransmitters, antibodies, hormones, haemoglobin, glycoproteins, actin and collagen ○ **Nucleic acids** e.g. deoxyribonucleic **acid (DNA)** and ribonucleic acid (RNA) in gene coding and expression ○ **Lipids** e.g. as an energy source, in the insulation of axons, as a component of cell membranes, in association with vitamins ○ **Proteins** e.g. enzymes, neurotransmitters, antibodies, hormones, haemoglobin, glycoproteins, actin and collagen ○ **Nucleic acids** e.g. deoxyribonucleic **acid (DNA)** and ribonucleic acid (RNA) in gene coding and expression ○ **Lipids** e.g. as an energy source, in the insulation of axons, as a component of cell membranes, in association with vitamins in maintaining physiological and psychological health. ● **Discuss** how disruption to the normal functioning of biological molecules leads to the development of **one** physiological disease/disorder and **one** psychological disease/disorder. You must choose one physiological disease from: ○ cancer ○ coronary heart disease ○ diabetes mellitus and one psychological disease from: ○ depression ○ dementia • **Evaluate** the significance of the disruption of biological molecules on **one physiological** and **one psychological disease/disorder** you have chosen by considering the impact of: ○ errors in protein formation and the consequent disruption to the proteins' functional shape (secondary, tertiary and quaternary structure) ○ the link between antibodies, hormones and type 1 diabetes ○ how inaccurate base pairing during DNA replication leads to disease or disorder ○ the effects of low-density lipoprotein (LDL) and high-density lipoprotein (HDL) on the cardiovascular system ○ the role of amyloid and tau proteins in dementia ○ dysregulation of enzyme production in depressive illness Correct scientific terminology must be used and sources must be referenced.
Checklist of evidence required	● An evaluation of the effects of disruption of biological molecules and their effects one physiological and one psychological disease/disorder. ● a discussion of how disruption to biological molecules leads to one physiological and one psychological disease or disorder in the human body. ● An explanation of the importance of nucleic acids, proteins and lipids in maintaining physiological and psychological health in humans.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
A.D1	Evaluate the impact of disruption for one physiological and psychological disease or disorder.
A.M1	Discuss how disruption to biological molecules and processes can lead to one physiological and one psychological disease or disorder.
A.P1	Explain the importance of proteins, nucleic acids and lipids in maintaining physiological and psychological health.
Sources of information to support you with this Assignment	Hartley, J. et al. *Pearson BTEC National Applied Science Student Book 1,* 2016 (ISBN; 978-1292134093) Ferrier, Denise R., *Biochemistry (Lippincott's Illustrated Reviews Series)*, 6th edition, Lippincott Williams and Wilkins, 2013 (ISBN: 978-1451187533). An illustrated book to help the learner – written expressly for advance level learners. https://www.s-cool.co.uk/a-level/biology/biological-molecules-and-enzymes https://www.youtube.com/playlist?list=PLwBILz9eQBWOTFnPZALWOQhUBWdn5Rp22 https://www.livestrong.com/article/281655-functions-of-lipids-carbohydrates-nucleic-acids-proteins/ http://sitn.hms.harvard.edu/flash/2010/issue65/ https://courses.lumenlearning.com/boundless-biology/chapter/dna-repair/ https://www.alzheimers.org.uk/sites/default/files/pdf/factsheet_genetics_of_dementia.pdf
Other assessment materials attached to this Assignment Brief	e.g. work sheets, risk assessments, case study